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most useful compilation of this chapter of physiological psychology that has yet appeared. It owes much to the marked analysis of Horwicz, but differs from that author in several respects. A too frequent mention of Dr. Jäger is perhaps the only point of fault-finding which may safely be indulged in, without bordering on hypercriticism, which in this difficult field is especially out of place.

J. JASTROW.

*Die Seelenblindheit als Herderscheinang und ihre Beziehungen zur Homonymen Hemianopsie zur Alexie und Agraphie.* Von DR. HERMANN WILBRAND. Wiesbaden, 1887. pp. 192. 8vo.

No question in the study of localization of brain functions has called forth such a voluminous and violent controversy as that of the centres of vision. No other question has led to such important and suggestive conceptions of the nature of brain centres, or has been attacked by so many and such ingenious methods. When Munk destroyed certain regions of the dog's brain and found as the permanent result a loss of the memory-pictures of sight, while the animal used its eyes to avoid obstacles, etc., as before, he gave to this condition the name of "psychic blindness" (*Seelenblindheit*). The dog could see as long as his lower optical centres were intact; to recognize and interpret what he saw required the higher cortical centres.

A precisely analogous condition is produced by cortical disease in man. Dr. Willbrand gives two classical cases of this nature, one from Charcot's clinic, the other from his own. In both these cases the intelligence was intact and the description of the symptoms by the patient extremely definite and valuable. Charcot's case is especially conclusive, because the subject of it possessed before his trouble a remarkable visualizing faculty. He could read pages of his favorite authors from the mental picture of the printed book which appeared before him; when he thought of a certain spot he visualized a complete colored photograph of it. During his attack all this had to be transferred to the ear, and to remember anything he had to repeat it *aloud* to himself.

The conclusions to which Dr. Willbrand's study leads him are briefly these: If the conduction of impressions along the optic tract be hindered, blindness in the ordinary sense is the result. But visual hallucinations, dream-visions and subjective light sensations are possible, and the memory of the world of sight remains. If the perceptive centre of one hemisphere is destroyed, unilateral cortical blindness ensues, appearing as an absolute and complete hemianopsia of the opposite holds of the field of visions. If both hemispheres are thus affected, hallucinations and subjective vision are impossible, but the memory of seen objects need not be impaired.

If, however, it is the "optical memory areas" that are affected, form and color may be seen, but they make an unfamiliar impression. The visual phantasy gradually atrophies, and dreams become visionless. Subjective light-impressions remain. It must also be remarked that these phenomena are liable to complication by loss of names for visual objects.

Dr. Willbrand's book will take its place amongst the most valuable contributions to this intricate subject, which perhaps more than any other offers a promising path to a deeper knowledge of

the nature of psychic functions. The value of the book is enhanced by a chapter describing the process of learning to see in those who, born blind, have been restored to sight.

J. JASTROW.

*Physiologische Studien über Psychophysik.* Von DR. FRANZ CARL MÜLLER. Archiv. für Anat. u. Physiol., Heft III. u IV. 1886.

This third German investigator of his name in the field opened by Weber's law, attempts to determine how the negative variation needful to excite a just observable contraction is related to absolute intensity of the [ascending] current. For this purpose a single pair of unpolarized electrodes served for the permanent and for the reversing current in such a way that when the contact was closed the currents were separated and compensated; when it was open they combined, causing a negative variation. The sciatic nerve of a frog was first observed, and the minimal contractions of the toe-muscles directly observed. The quotient of the intensity of the larger current (measured in divisions of the current passed over by the needle of the galvanometer), divided by that of the variable current, here measures the psychophysics relation sought. This quotient begins in feeble currents with a threshold intensity of unity, and increases rapidly to two or three times its initial value, and then remains constant for a time, till with very strong currents it sinks again. Although the first period of increasing differential sensibility is quite analogous to the lower limit of Weber's law, the second period of constant quotients, the extent of which differs for different nerves, is especially important. Very similar results were attained on rabbits and guinea pigs. Percutaneous stimulation by the same method on the motor points of various digital muscles in the human arm, gave results with somewhat greater irregularity, but with a long second period of constant quotients. Next, instead of just observable muscular contraction, just observable differences of sensation were attempted with similar results. From these experiments Dr. Müller feels himself justified in calling Weber's law only one [psycho-physic] case of a larger "neuro-physic" law which applies to all stimuli that diminish excitability, and formulates his law as follows: "The excitation caused by a change of intensity of a stimulus that diminishes excitability remains the same (under conditions otherwise similar and within certain limits of absolute intensity of stimulus), if the relation of the change of intensity to the intensity on the basis of which the change is made remains the same. Outside these limits, with constant relation between intensity and change of intensity from one degree of stimulus to the next higher, an increase of excitation occurs with small, and a decrease with great intensity."

A sensation of difference which Fechner substituted for Weber's difference of sensation, is not a sensation at all, but a judgment. A sensation due to a constant stimulus is physiologically a state of diminished excitability. Changed excitability is thus an essential property of sensation which serves as an index to the inner dynamic, or neurotonic state of the nerve. The act of bringing two sensations, or even the memory of two past sensations into relation, or comparing them by alternating from one to another, is the simplest form of any judgment, and is physiologically represented by